U.S. Department of the Interior
Bureau of Land Management
Wyoming State Office

Worland Field Office

August 2004

ENVIRONMENTAL ASSESSMENT for the Right-of-Way Application of the Wyoming Water Development Commission for an Exploratory Water Well and Access Road in the Bureau of Land Management's Washakie Planning Area

MISSION STATEMENT

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U.S DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Environmental Assessment
WY-010-EA3-77

Right-of-way Application of the Wyoming Water Development Commission for an Exploratory Water Well and Access Road in the Bureau of Land Management's Washakie Planning Area

Prepared by the
U.S. Department of the Interior
Bureau of Land Management
Worland Field Office
Worland, Wyoming

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Applicant:	Wyoming Water Development Commission Herschler Building, 4-West Cheyenne, WY 82002
Serial Number:	WYW-156319
Type of Project:	Water Well (250' x 250' – 1.435 ac.) and Road (30' x 11,165' – 7.689 ac.) Right-of-Way
Well Name and Number:	Lysite Mountain No. 1
Lands Involved:	NW¼SE¼, sec. 1; lots 3 and 4, sec. 2, T. 42 N., R. 91 W., SW¼SW¼, sec. 5, SE¼SE¼, sec. 6, E½NE¼, sec. 7, W½W½, sec. 8, T. 42 N., R. 90 W.
Surface Ownership:	Federal
Mineral Ownership:	Federal

I. PURPOSE AND NEED

A right-of-way is required from the Bureau of Land Management to allow the Wyoming Water Development Commission to drill an exploratory well and produce water for test purposes, pursuant to a permit from the Wyoming State Engineer. The BLM's issuance of a right-of-way for this purpose is authorized by the Federal Land Policy and Management Act, analyzed subject to the National Environmental Policy Act, and regulated by 43 CFR 2800.

The Wyoming Water Development Commission (WWDC) is assisting the Big Horn Regional Joint Powers Board in an effort to evaluate the feasibility of developing a water source and distribution system for the Thermopolis area, and joining it into a larger regional system with the Worland and Greybull municipal systems, the South Big Horn County Water Supply Joint Powers Board system, and the Washakie Rural water supply system. With water delivered to this regional system from a variety of sources and locations, it is anticipated that water would be available to all users of the system if any part of the system fails. The WWDC and Joint Powers Board have sponsored public meetings in Thermopolis and Worland to disseminate information and gather comments regarding their efforts.

The WWDC has submitted an application for a right-of-way (R/W) for drilling a water well at a site located on public land, and to use portions of an existing road across public land for access to the proposed well site.

The stated purpose of this well is to test the yield potential of the Ten Sleep and Madison/Big Horn Aquifers in the southeast portion of Hot Springs County and monitor its impact on oil wells and water wells and natural springs and streams in the area.

The scope of the proposed well project is limited by the temporary nature of the access agreements between the WWDC and the private landowners involved, and the nature of the water permit filed with the Wyoming State Engineer.

The WWDC and private landowner agreements for access expire August 17, 2005 and June 16, 2006. Renewing these agreements is at the discretion of the landowners involved.

According to the Application for Permit to Appropriate Ground Water for a test well, the water from a test well is not intended for beneficial use. Another application would need to be filed with the Wyoming State Engineer to develop the well for beneficial use.

In addition, a proposal to develop a water plant and related facilities on public land would require that WWDC file a Plan of Development with the BLM addressing all relevant issues, including access, potential effects on oil and gas production, natural spring and stream flows, and elk habitat, among others. Future large-scale development of the water source could also include agreements for providing alternative sources of water to local landowners and grazing permittees, through replacement wells or putting taps on the new

source of water, if the present water sources are disrupted. Although the $1.28 million cost of the well (based on published estimates) would be taken into consideration in future analyses, a proposal for further development would still be subject to full disclosure and public participation in the BLM's decision-making process.

II. ISSUES AND CONCERNS

The primary issues surrounding the proposal come from the perception that almost 2,000 gallons of water per minute would be produced from the well for regional water supply purposes. The sustained use of that much ground water (2,000 gpm) might conceivably have adverse impacts on oil and gas production and water sources necessary for wildlife and livestock. These uncertain impacts have concerned a number of individuals and an oil company, Phoenix Production Company, the operator of the nearby Black Mountain Oil Field. Data from flow testing the well may help address these concerns.

What has evolved out of many public meetings regarding the proposal is that the target volume of water expected to be produced from this well would be around 500 gpm, almost a fourth of the amount of water discussed in early meetings regarding the well. The WWDC has explained that the nearly 2,000 gpm believed to be needed to support the regional water supply concept is not reasonably obtainable from one well.

The $1.28 million cost of the project has prompted comment to the effect that once initiated, the well would not be shut down if a significant flow of water is found and therefore the analysis of the proposal at this stage should consider the impacts of future water plant development. However, judging from the many conflicting opinions voiced in public meetings, the BLM believes there is enough that is unknown to warrant analyzing just the impacts of drilling a single exploratory well, and postponing the analysis of possible future activities, until the potential for water development in the area is better understood. Likewise, the WWDC has demonstrated in public meetings that it is willing to advocate the drilling of this test well to obtain water development information, even in light of the large expenditure.

There is concern that development of the water well site may impact the elk population in the area. This concern is based primarily on the future development and operation of water plant facilities, including storage tanks, treatment facilities, roads, and pipelines. A request for additional development in this location would be dependent on many factors as yet unknown, and would be subject to further disclosure and analysis prior to a decision.

III. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action

The Wyoming Water Development Commission has filed an application for a right-of-way (R/W) to drill a water well on public land located approximately 25 miles east of

Thermopolis (Map Exhibit). The R/W is on file in the Worland Field Office and is considered an integral part of this environmental assessment (EA) by reference. The applicant's technical specifications for water well drilling and construction and American Water Works Association Standard for Water Wells, on file, are considered part of the proposed action. The application also includes the use of those portions of an existing road that cross public land for access to the proposed well site. The following table displays some basic information on the proposed water well.

Well Name and Number	Lysite Mountain No. 1
Date Received	7/24/03
Serial Number	WYW-156319
Well Location	NW¼SW¼, sec. 8, T.42 N., R.90 W.
Well Type	Water (Test)
Land Status-Surface	Federal
Land Status-Mineral	Federal
Proposed Depth	4,450 feet
Existing Road	11,165 feet (graded as needed at various locations)

A joint inspection of the proposed location of the drill site and the access road to the location was held on September 3, 2003 with John Marcelli (BRS Engineering) and Victor Trickey (BLM) in attendance.

The well drilling and construction specifications and AWWA Standard for Water Wells document were received from BRS Engineering post marked February 27, 2004. It has been reviewed by a BLM petroleum engineer.

The proposed action is to issue a right-of-way for the construction, operation, maintenance, and termination of a water well, and for use of an existing road for access on public land administered by the Bureau of Land Management. A map and photos of the project area are attached. The agreements between the WWDC and landowners for access across their private lands expire August 17, 2005 (Merrill and Teresa H. Brown) and June 16, 2006 (Chuck L. Andreen). Therefore, the R/W is proposed to be granted for a term to expire August 17, 2005, with the right of renewal, subject to extension of the agreements for access.

Unless the agreements permitting access are extended, the well would be drilled and flow tested and the site would be restored, including well plugging and abandonment if necessary, before August 17, 2005. Monitoring the effects of the well on water sources and oil production would also be completed by August 17, 2005 unless the access agreements and R/W duration are extended.

Both the surface and mineral estates of the public land are owned by the United States. The public land involved is in an area subject to the following uses: domestic livestock grazing, wildlife habitat, watershed protection, open space, dispersed outdoor recreation, and oil and gas lease development.

Terms and conditions established by the Bureau of Land Management for the project would be incorporated as part of the proposed action and would include operating procedures intended to stabilize the watershed or otherwise minimize impacts to resource values. The terms and conditions include measures addressing standard issues such as pesticides, weed control, cultural resources, and the reduction of soil erosion and sediment load. A stipulation for the protection of elk crucial winter habitat would also be included restricting the timing of construction activities.

Use of the water would be subject to water right regulation by the Wyoming State Engineer. The public land involved would be used for water well drilling and road access. The facilities would be serviced on a regular basis and receive required emergency maintenance. Access on public land for construction, operation, maintenance, and termination of activities would be allowed under the proposed R/W.

The road proposed to be used to access the drill site crosses state, private and public land and would be used as it presently exists for the most part. Of the 11,165 feet of road located on public land, 4,852 feet would be subject to blading, ditching, and culvert placement where necessary to enable drilling equipment to access the proposed drill site (Map Exhibit and Photo Exhibit). Disturbance would be limited to the 30 foot wide R/W proposed (7.69 acres), including the travel surface and road slopes.

The pad size for the drilling location would be 250 feet by 250 feet (1.43 acres) including a reserve pit and other related drill site facilities. The well would be completed and tested in a controlled manner, in accordance with all the state standards and regulations that apply to water wells. The WWDC would drill a well for testing and monitoring purposes to a planned total depth of 4,450 feet. The flow of water expected to be encountered is unknown, but is reasonably expected not to exceed 500 gallons per minute. A rotary drill would be used to bore a 22-inch diameter hole with 18-inch diameter steel casing at the surface to 200 feet. A 16-inch diameter bore with 12-inch diameter steel casing would be drilled to 1,000 feet. Then, from 1,000 feet to 3,910 feet, the well would be bored to produce a hole 8 inches in diameter with 7 inch diameter steel casing. The remaining bore in the target Madison and Big Horn formations would be uncased from 3,910 feet to the total planned depth of 4,450 feet. The well would be subject to cementing at predetermined intervals to maintain the integrity of each formation through which it passes. The drilling proposal would be subject to Wyoming State Engineer and Department of Environmental Quality standards and regulations concerning water wells. Almost no facilities would be visible above ground for testing and monitoring purposes, except perhaps a metal cover over the well opening.

Dirt work, drilling, and testing are proposed to commence upon approval of the right-of-way, and pending availability of funds in 2005. The road will be graded to temporary standards. Roads for long-term use will be built to permanent standards.

After the test well is completed, certain technical operations may be performed in the well bore over its service life. Acid may be injected into carbonate formations, or formations could be fractured under pressure, in order to stimulate production. The well

will be plugged and abandoned, either after drilling (if the well is dry) or after some extended term of production.

Cement plugs would be used to isolate all oil or gas horizons, fresh water zones, lost circulation zones, casing stubs, and casing shoes. Surface plugs will be placed in all casing which extends to the surface, including any annular space.

Initial produced water will be confined to the drilling reserve pit. A temporary use permit could be required by BLM for the release of water outside the right-of-way for flow testing purposes, based on the volume and quality of water that would be released. Upon completion of testing, the well would be shut in pending analysis of test results.

A proposal to further develop the well for beneficial use would require a State water right permit and an amended right-of-way from the BLM.

The WWDC has certified that it is technically and financially capable of constructing, operating, maintaining, and terminating the proposed water well and road.

The proposed R/W would be approved subject to prior existing rights, BLM policy, regulations and land use plans, the applicant's stated operating procedures, and applicable laws and regulations. The standard mitigation guidelines for surface disturbing activities found in the Washakie Resource Management Plan (1988) and right-of-way stipulations found in the BLM's right-of-way handbook H-2801-1 are included by reference as part of the proposed action and as mitigating measures. (The Washakie Resource Management Plan can be viewed online at http://www.wy.blm.gov/wfo/plan/washrmp.htm The right-of-way handbook H-2801-1 is available for review at the Worland Field Office, 101 South 23rd Street, Worland, Wyoming.)

B. No Action Alternative - Not Approving the Permit

Under a no action alternative the R/W would not be granted and the proposed well would not be drilled. The opportunity to evaluate the water resource potential in this location would be denied.

Under right-of-way provisions, the BLM has the discretion to authorize drilling of the water well if the environmental consequences are not excessively severe. Damage to the surface and subsurface can be greatly mitigated under BLM guidelines and approved stipulations, with rehabilitation expected to occur upon abandonment of the site.

C. Relocation of the Drill Site and/or Access Road Location

Alternative well sites include the Lysite Mountain No. 2 and Lysite Mountain No. 3 wells. Both are located on the same ridge as the Lysite Mountain No. 1 well, within several hundred feet of one another. The analysis of impacts would be the same for all

three well sites. Private landowners have stipulated the allowed access route in agreements they have signed with the WWDC, thereby limiting the opportunity for discussion of alternative routes to the proposed well sites.

D. Approving the Project as Proposed by the WWDC Without Additional Terms and Conditions

On the basis of BLM staff specialist input and public comments, certain terms and conditions would be necessary and proper to provide adequate protection of the surface and subsurface resources. Those terms and conditions have been added to the original proposal submitted by the WWDC, and in combination with that proposal, make up the complete Proposed Action described in this EA.

IV. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The affected environment and the environmental consequences of the WWDC proposal and the Proposed Action are discussed in this section. Each discussion concludes with a section on mitigation, describing the additional terms and conditions to be required by the BLM within the Proposed Action.

The effects of R/W issuance were analyzed in compliance with Executive Order 13212 which directs the BLM to consider the President's National Energy Policy and any adverse impacts the activity may have on energy development. The analysis contained in this EA indicates that use of the lands for an exploratory water well for information gathering purposes and to determine whether the area has potential for future water development, would not disrupt or delay existing or planned energy development.

Potentially Affected Resources and Land Uses

Subsurface Geology

Affected Environment - The well is being drilled into the Big Horn and Madison formations. The drilling would penetrate several formations, including the Cody Shale, Frontier, Mowry, Thermopolis, Cloverly, Morrison, and Sundance. The Gypsum Springs, Chugwater, Phosphoria, Ten Sleep Sandstone, and Amsden formations would also be encountered.

Environmental Consequences - In any drilling or production operation, there is a potential to for the integrity of various formations to be compromised. Casings occasionally develop leaks and sometimes wells are completed in the wrong zones. If wells are not properly drilled, considering well bore pressures and fracture gradients, contaminants or product may move along the casing, commingling in other strata. There is concern that drilling would adversely impact undeveloped future oil and gas production in the Black Mountain area. There is also concern that drilling would possibly dry up currently flowing wells, springs, and creeks in the Black Mountain and Lysite Mountain areas. At public meetings sponsored by the WWDC and Joint Powers

Board, oil company represents questioned whether the likelihood of the well striking oil, in addition to water, had been considered.

Mitigation - The applicant's proposed drilling plan was reviewed by a BLM petroleum engineer. The drilling standards, specifications, setting depths, and cementing criteria were checked for preservation of well bore and strata integrity. Required engineering terms and conditions have been added to the original proposal, including a requirement that the exploratory well comply with Federal Onshore Order #2 – Drilling Operations. This Order specifies the uniform national standards for performance, when an operator or contractor conducts oil well drilling operations on federal lands. Other specific terms and conditions follow:

A 2,000 pound blowout preventer (BOP) valve shall be installed and tested (third party tested) prior to drilling out the casing shoe at 1,000 feet.

The 2,000 pound working pressure of the blowout preventer stack and choke manifold shall be adequate to handle anticipated bottomhole pressures; and the drilling mud density shall be calculated to be sufficiently high to contain wellbore pressures, but not so high as to exceed the fracture gradient of formations to be encountered.

The standards and specifications filed show that WWDC proposes hanging 7 inch casing in 12-3/4 inch casing. Standard BLM requirements call for a minimum of 100 feet of overlap between a string of casing and the next larger casing.

The 12-3/4 inch and 7 inch casings should be tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield.

A cement bond log shall be run to insure the cement job on the 7 inch casing is adequate to prevent the commingling or migration of fluids among various formations.

This well will be drilled through geological formations known to contain hydrogen sulfide gas. A hydrogen sulfide drilling plan shall be filed with the BLM by the well contractor before the start of drilling.

Additional actions such as recompletions or plugging operations shall be similarly designed and reviewed to prevent bursts in the casing, leakage, or blowouts.

Cultural Resources

Affected Environment - The BLM has conducted a Class III (detailed, site-specific) Cultural Inventory. No significant cultural resources were found.

Environmental Consequences - Cultural resources would not be affected by road work or well drilling.

Mitigation - A standard stipulation which addresses actions required if cultural resources are discovered during construction will be included in the right-of-way. This requirement includes evaluation of the discovery in consultation with the State Historic Preservation Officer (SHPO) and, if required, development of further mitigation measures in consultation with the WWDC, SHPO, and the Advisory Council on Historic Preservation. The standard cultural resource stipulation reads as follows:

The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials and contact the authorized officer (AO). Within five working days the AO will inform the operator as to:

- whether the materials appear eligible for the National Register of Historic Places;
- the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and,
- a time frame for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate.

If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction.

Soils, Vegetation, and Watershed

Affected Environment - The location for this well is on a ridge at an approximate elevation of 5,500 feet, above a steep-sided drainage. The proposed well site is located in the 10 to 14 inch precipitation zone in the Bighorn Basin. This site has a potential for moderate to high runoff.

The soil type is mapped as a Samsil-Shingle-Rock Outcrop complex which occurs in Hot Springs County on gently sloping to moderately steep ridge tops and side-slopes. The soil is made up of 50 percent Samsil clay on clayey shales, 20 percent Shingle loam on silty shales, and 15 percent rock outcrop on escarpments and eroded ridges. The Samsil clay soil is shallow and well drained. Permeability of the Samsil clay soil is very slow. Available water capacity is about 1 to 2 inches. Effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is moderate. The Shingle loam soil is shallow and well drained. Permeability of the Shilgle loam soil is moderate. Available water capacity is 1 to 3 inches. Runoff is

rapid, and the hazard of water erosion is high. The hazard of soil blowing is also high in this soil type.

Key forage grass species include Bluebunch wheatgrass, Needle and Thread grass, and Indian ricegrass. The ground cover ranges between 20 and 30 percent with the vegetation consisting of 75 percent grasses and grass-like plants, 10 percent forbs, and 15 percent woody plants.

Environmental Consequences - The pad and reserve pit area overlook a steep-sided drainage. Improper construction of the reserve pit could result in a pit breach which could allow the pit contents to reach a surface drainage which empties into Nowater Creek, or drain into a low, mud wallow area on the ridge.

Unacceptable erosion and possible contamination by reserve pit fluids could result if the pad and reserve pit are not properly reclaimed upon the completion of drilling. Additionally, the pit may leak into porous soils.

If the pit is dug in fill portions of the pad the contents may be spread over the pad area at the time of reclamation, causing possible soil contamination.

Many subsequent actions, like routine fracturing of wells, work over operations, well repair, etc., require use of compounds that may be hazardous.

Substances used for the drilling and producing of this well may be improperly handled.

The right-of-way would authorize well pad and road use on approximately 9 acres of public land surface. Removing vegetation would make the right-of-way area more susceptible to wind and water erosion. Sediment loading occurs in wet conditions on drill pads and roads deficient in ditching, cross drainage, width, stable bases, and graveling. Temporary roads that are adequate in dry and frozen conditions may be completely inadequate when wet and muddy. In these conditions water often runs along wheel ruts. Normal traffic churns up mud and sediments that are carried into drainage channels. Such roads become boggy and impassible which forces traffic outside the road, causing even more damage to the watershed.

Long-term watershed quality can be seriously impaired by improper grading or vegetation establishment. When a reserve pit is covered prematurely, the contents often become squeezed over the site and create a potential for contamination.

Given the steep slope and high runoff potential, construction of the well pad, reserve pit, and access road will need to be performed in a manner that minimizes the erosion potential.

Much of the livestock use in the area occurs in the spring and summer. Livestock grazing capacity will not be reduced as a result of the amount of surface taken up by this project.

Livestock, along with wildlife, rely heavily on existing water sources such as wells, springs, and seeps. Grazing permittees worry about their wells going dry and being left with inadequate water in their allotments.

Mitigation - When roads are graded to temporary standards for drilling, the BLM may prohibit their use during wet and unstable conditions.

All roads will have proper drainage and stability.

Topsoil will be removed and properly stored.

When the pad and road are reclaimed, they will be graded to the original contours, topsoil will be replaced, and disturbed areas will be reseeded.

To prevent any loss of fluids from the reserve pit, prevent erosion, and protect watershed values in the steep-sided drainage immediately east of the drilling location, the reserve pit will be constructed with an impervious liner.

The pit will be restored only after it has properly dried out.

To promote safe material handling, disposal of any wastes in temporary pits is prohibited.

All major stages of construction will be done in coordination and consultation with BLM personnel.

Roads needed for long-term use will be built to permanent standards.

Reseeding the site with native species will be required for rehabilitaton and site restoration because those species are well-adapted to the site. Thickspike wheatgrass (1 pound per acre), Bluebunch wheatgrass (1½ pounds per acre), and Green needlegrass (1 pound per acre) should be used in the seeding mix.

Yarrow (½ pound per acre), drought resistant wildland or upland alfalfa (¼ pound per acre), Arrowleaf balsamroot (¼ pound per acre) and wild clover (Trifolium genus) (¼ pound per acre) should also be added to the seed mix. Mountain sagebrush tuberlings and Basin wildrye or Elymus (½ pound per acre) should be added to the mix at the bottoms of draws.

Revegetation will be completed in accordance with BLM reclamation standards.

Wildlife

Affected Environment - The proposed well site is located on the edge of crucial elk winter range. Actual impacts are expected to range from slight to none considering the season of use restrictions that would apply to well drilling activity under the proposed

terms and conditions. Access across public land will be restricted from November through May, if necessary to protect elk that are dependant on the winter range.

The BLM's review of the proposal determined that there would be no effect on listed threatened or endangered or sensitive plant or animal species or their critical habitat.

Environmental Consequences - Approximately nine acres of vegetation will be affected by the well pad and road. This will affect wildlife habitat locally for the life of the well.

Noise from the drilling activity and increased vehicle traffic to the well location would not be a problem because of the temporary nature of the work. Wildlife would tolerate the low level activity or avoid the site without difficulty.

Mitigation - The reserve pit will be fenced and flagged.

Mitigation to protect winter elk populations, if elk are present and dependant on that area, would prohibit drilling operations from November 1 through May 31.

Visual Resources

Affected Environment - The project area is in a Class IV visual management area. In this class the objective is to partially retain the existing character of the landscape, and any contrast should repeat the line, color, and texture of the characteristic land forms.

Environmental Consequences – Any structure associated with the exploratory well would be fairly unobtrusive, most likely consisting of a protective cover, or a well house, for the well head equipment. Potential visual affects could be reduced if the structure is painted in an earth-tone color.

Smoke and dust from drilling activities will cause a temporary impact to the casual user. There could be a hydrogen sulfide gas danger to casual users.

Trash may blow off the site if it is improperly contained.

Mitigation - Visual impacts will be mitigated by painting structures (if any structures are present) with the Standard Environmental Color "Carlsbad Canyon."

Trash will be stored in a portable container until it is hauled to an appropriate landfill.

To mitigate visual impacts at the completion of drilling, the unused portion of the pad will be recontoured and seeded to blend into the surrounding landscape.

Socioeconomics

Affected Environment - This category embraces all other uses that may be affected.

Hot Springs State Park, with its featured Big Spring, is located approximately 25 miles west of the proposed drill site.

The Black Mountain Oil and Gas Field is located approximately one mile north of the proposed drill site.

The project area is in the KIS grazing allotment. Use normally occurs during the months of June and July. Dennis Ranches (Joe Dennis) is the current grazing permittee.

Environmental Consequences - There is concern that drilling this well will diminish groundwater supplies and oil and gas reservoir dynamics, negatively impacting tourism, hunting, ranching, and oil and gas operations. These multiple uses of the land have a positive effect on the economy of the region, providing jobs and tax revenues.

Mitigation - Refer to the previous sections for mitigation related to surface disturbing activities. The mitigation of subsurface disturbance would be addressed by State of Wyoming standards and safeguards put in place for the drilling of water wells, and by the BLM-required terms and conditions listed in the section on subsurface geology.

Hazardous Materials

Affected Environment - The following hazardous materials may be used, produced or stored as a part of the construction and drilling activity:

- natural gas and fuels - (potentially containing benzine, toluene, xylene, methyl-tert-butyl ether, and tetraethyl lead).
- antifreeze - ethylene glycol, if contaminated with lead or chromium above regulatory levels.
- combustion emissions - nitric oxides (NOx), polynuclear aromatic hydrocarbons.
- lubricants - grease (potentially containing polynuclear aromatic hydrocarbons and lithium compounds) and motor oil.
- miscellaneous materials - paint, solvents, fertilizers, and herbicides.

Environmental Consequences - In a worst-case-scenario there could be environmental impacts associated with a hazardous material release, such as an accidental spill or an inappropriate discharge. This could result in impacts to the soil, water, air, wildlife, and cultural resources, in addition to impacts to human health and safety. Proper containment of fuels, oil, and other hazardous materials in appropriately designed and maintained storage facilities, and an immediate response in the event of a release, would greatly reduce any potential impacts.

Mitigation - Hazardous substances specifically listed as hazardous waste or demonstrating a character of a hazardous waste (see 40 CFR Part 261 - Identification and Listing of Hazardous Wastes; and 40 CFR Part 355 - Emergency Planning and Notification) will not be improperly used, produced, stored, transported or disposed of in connection with the right-of-way operations.

The WWDC and its contractors would comply with all applicable federal and state laws and regulations. All hazardous materials would be handled in an appropriate manner to prevent environmental contamination. Any release of hazardous materials in reportable quantities would be reported to the National Response Center (NRC), as required in the National Oil and Hazardous Materials Contingency Plan (40 CFR 300), and to the BLM authorized officer as required by the Worland Field Office Hazardous Materials Contingency Plan.

V. MANDATORY CRITICAL ELEMENTS

The following items have been reviewed for this action under all alternatives:

Element	Relevant Authority	Affected	Not Affected
Air Quality	The Clean Air Act as amended (42 USC 7401 et seq.)		X
Areas of Critical Environmental Concern	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.)		X
Cultural Resources	National Historic Preservation Act as amended (16 USC 470)		X
Environmental Justice	E.O. 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, 2/11/94		X
Farm Lands (prime or unique)	Surface Mining Control and Reclamation Act of 1977 (30 USC 1201 et seq.)		X
Floodplains	E.O. 11988, as amended, Floodplain Management, May 24, 1977		X
Invasive, Nonnative Species	Lacey Act, as amended Federal Noxious Weed Act Of 1974, as amended Endangered Species Act		X

	Of 1073, as amended E.O. 13112, Invasive Species, 2/3/99	
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 (42 USC 1966)	X
Threatened or Endangered Species	Endangered Species Act of of 1973 as amended (16 USC 1531)	X
Wastes, Hazardous or Solid	Resource Conservation and Recovery Act of 1976 (42 USC 6907 et seq.) Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (42 USC 9615)	X
Water Quality (Surface and Ground)	Safe Drinking Water Act as amended (42 USC 300f et seq.) Clean Water Act of 1977 (33 USC 1251 et seq.)	X
Wetlands/Riparian Zones	E.O 11990, Protection of Wetlands, May 24, 1977	X
Wild and Scenic Rivers	Wild and Scenic Rivers Act as amended (16 USC 1271)	X
Wilderness	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.) Wilderness Act of 1964 (16 USC 1131 et seq.)	X

VI. RESIDUAL ENVIRONMENTAL IMPACTS

Cumulative Impacts

Air Quality

Air quality will lessen due to emissions from the rig engine and dust from vehicular traffic. Noise levels would increase during the construction and drilling periods. Additional vehicular use could be permanent if agreements for access are extended and the well becomes a producing water well. This would cause some additional dust in the air.

Subsurface Geology

No cumulative effects would occur.

Cultural Resources

No cumulative effect would occur.

Soils, Vegetation and Watershed

Some soil and sediment could be introduced into the Bighorn River via Bader Draw and Nowater Creek, from surface-disturbing activities. Most effects to soils would be temporary following reclamation. There would be a long-term effect due to the displacement of vegetation in the nine acres in the right-of-way. The rated grazing capacity for the shallow loamy soil type in this area would remain unchanged. Less than 1 AUM would be lost for livestock grazing due to the drilling of this water well. No reduction in livestock use would be necessary.

Wildlife

An almost imperceptible reduction in wildlife habitat would occur since the proposed use involves an existing trail for access. The 250 by 250 foot well pad would occupy 1.435 acres. The reduction in crucial elk winter habitat is probably not significant due to the probability that elk will tolerate the intensity of the proposed activity, or the activity will be restricted during the crucial elk winter range season. Considerable disturbance has already taken place over the past 40 years in the development of the Black Mountain Oil Field. Animals generally become accustomed to activity associated with drilling. Experience with reclamation of disturbed sites in oil fields demonstrates that drilling the proposed well in crucial elk winter range may be effectively mitigated.

Visual Resources

At the completion of the drilling activity and site reclamation there will be a minor effect on visual resources. The visual impacts of the water well would be minimized by the requirement that all facilities be painted to blend in with the surrounding terrain.

Socioeconomics

No cumulative effects would occur.

VII. CONSULTATION AND COORDINATION

This EA was prepared by Victor Trickey.

BLM staff specialists reviewed the proposal and identified impacts and appropriate mitigation measures. The following personnel reviewed or have been contacted with regard to this EA and Record of Decision.

Tom Ball	Wildlife Biologist
Matt Baker	Petroleum Engineer
Mike Bies	Archaeologist
Brendan Cain	Hydrologist
Jayne Doyle	Natural Resource Specialist
Karen Hepp	Rangeland Management Specialist
Jeff Johnson	Outdoor Recreation Planner
Curtis Bryan	Rangeland Management Specialist
Kevin Boyce	Wyoming Water Development Commission
John Marcelli	BRS Engineering

WWDC held numerous public scoping sessions in consideration of the scope and nature of the proposed action. This environmental assessment is being made available for 30 days of public review and comment before the BLM makes a decision on the proposal.

VIII. APPENDIXES

A. Map Exhibit
B. Proposed Well Completion Diagram
C. Terms and Conditions for WYW-156319
D. Photo Exhibit

The holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the application which was approved and made part of the grant on its effective date. Any relocation, additional construction, or use that is not in accord with the approved grant, shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way grant, including all stipulations and approved development plan, shall be made available to the authorized officer on the right-of-way area during construction, operation, and termination. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.

The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials, and contact the authorized officer. Within five working days the authorized officer will inform the operator as to:

-whether the material appears eligible for the National Register of Historic Places;

-the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and,

-a timeframe for the authorized officer to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the authorized officer are correct and that mitigation is appropriate. If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the authorized officer will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The authorized officer will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the authorized officer that the required mitigation has been completed, the operator will then be allowed to resume construction measures.

The holder will be responsible for taking such measures as may be necessary to protect other authorized facilities on public lands from damage due to construction or use of this right-of-way. The holder is responsible for contacting those other users and coordinating with them.

Where slope stabilization requires significant terrace or bench construction, the holder shall include engineering drawings for this work to be reviewed, and, where appropriate, modified and approved by the authorizing officer.

The holder shall submit standard or typical cross sections of the road to be constructed, maintained, or reconstructed, as directed by the authorized officer. The cross sections should

include, but are not limited to, the proposed road width, ditch dimensions, cut and fill slopes, and typical culvert installation.

The design and location of all facilities shall be approved by the authorized officer prior to construction.

All design, material and construction, operation and termination practices shall be in accordance with safe and proven engineering practices.

All roads will have proper drainage and stability.

Roads used for long term use will be built to permanent standards.

Use of roads graded to temporary standards for drilling will be suspended during wet and unstable conditions.

Appropriate topsoil will be removed and properly stored.

When the pad and road are reclaimed, they will be graded to the original contours, topsoil replaced, and disturbed areas will be reseeded.

The pit will be restored only after it has properly dried out.

To promote safe material handling, disposal of any wastes in temporary pits is prohibited.

All major stages of construction will be done in coordination and consultation with BLM personnel.

The reserve pit will be fenced, flagged, and lined (to prevent loss of fluids from the pit).

Trash will be stored in a portable container until it is hauled to an appropriate landfill.

The well shall be completed and tested in accordance with all the state standards and regulations that apply to water wells, and the following BLM stipulations:

> Cement plugs shall be used to isolate all oil or gas horizons, fresh water zones, lost circulation zones, casing stubs, and casing shoes. Surface plugs will be placed in all casing which extends to the surface, including any annular space.
>
> Initial produced water will be confined to the drilling reserve pit.
>
> A BLM temporary use permit will be required for the release of water outside the right-of-way for flow testing purposes, depending on the volume and quality of water that would be released, in consultation with the authorized officer.
>
> Upon completion of testing, the well will be shut in pending analysis of test results.

A 2,000 pound blowout preventer (BOP) valve shall be installed and tested (third party tested) prior to drilling out the casing shoe at 1,000 feet.

The working pressure of the blowout preventer stack and choke manifold shall be adequate to handle anticipated bottomhole pressures; and the drilling mud density shall be calculated to be sufficiently high to contain wellbore pressures, but not so high as to exceed the fracture gradient of formations to be encountered.

The standards and specifications are to hang 7 inch casing in 12-3/4 inch casing. BLM requirements call for a minimum of 100 feet of overlap between a string of casing and the next larger casing.

The 12-3/4 inch and 7 inch casings shall be tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield.

A cement bond log shall be run to insure the cement job on the 7 inch casing is adequate to protect the commingling or migration between various formations.

A hydrogen sulfide drilling plan shall be filed with the BLM by the well contractor before the start of drilling.

Hazardous substances specifically listed as hazardous waste or demonstrating a character of a hazardous waste (see 40 CFR Part 261 - Identification and Listing of Hazardous Wastes; and 40 CFR Part 355 - Emergency Planning and Notification) will not be improperly used, produced, stored, transported or disposed of in connection with the right-of-way operations.

The WWDC and its contractors shall comply with all applicable federal and state laws and regulations. All hazardous materials would be handled in an appropriate manner to prevent environmental contamination. Any release of hazardous materials in reportable quantities would be reported to the National Response Center (NRC), as required in the National Oil and Hazardous Materials Contingency Plan (40 CFR 300), and to the BLM authorized officer as required by the Worland Field Office Hazardous Materials Contingency Plan.

The holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.

Construction activity and surface disturbance will be prohibited from November 1 through May 31 for the protection of crucial elk winter habitat. Any exceptions to this requirement must have prior written approval from the authorized officer.

To mitigate visual impacts at the completion of drilling, the unused portion of the pad will be recontoured and seeded to blend into the surrounding landscape.

Visual impacts will be mitigated by painting all aboveground structures an approved color in

consultation with the authorized officer or otherwise using non-reflective materials that blend in with the surrounding landscape. Permanent vegetation canopy cover, production and species diversity on the right-of-way shall approximate the surrounding undisturbed area upon completion of site rehabilitation.

The holder shall be responsible for weed control on disturbed areas within the limits of the right-of-way. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods.

As directed by the authorized officer, the right-of-way shall be winterized by providing a well-drained right-of-way by water baring, maintaining drainage, seeding and any additional measures necessary to minimize erosion and other damage to the right-of-way or the surrounding public lands.

Holder shall remove only the minimum amount of vegetation necessary for the construction of structures and facilities. Topsoil shall be conserved during excavation and reused as cover on disturbed areas to facilitate growth of vegetation.

The holder shall seed all disturbed areas with the following seed mixture:

1 lb./ac.	Thickspike wheatgrass
2 lb./ac.	Bluebunch wheatgrass
1 lb./ac.	Green needlegrass
.5 lb./ac.	Yarrow
.25 lb./ac.	drought resistant wildland or upland alfalfa
.25 lb./ac.	Arrowleaf balsomroot
.25 lb./ac.	Wild clover (Trifolium genus)

In drainage slopes and bottoms add the following:

ARTRV or Mountain sagebrush tuberlings

.5 lb./ac.	Elymus or Basin wildrye

The seed mixture(s) shall be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weed seed in the seed mixture. Seed shall be tested and the viability testing of seed shall be done in accordance with State law(s) and within 6 months prior to purchase. Commercial seed shall be either certified or registered seed. The seed mixture container shall be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed shall be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed should be drilled between ¼ and ½ inches deep, depending upon the seed and soil condition. It is helpful to have depth bands on the drill and to have a drill with an agitator or special grass seeding attachment for exceptionally hairy or small seeds. Where drilling is not possible, seed shall be broadcast at double the drilled rate. The seeding will be repeated until a satisfactory stand is established as determined by the authorized

officer. Evaluation of growth will not be made before completion of the growing season after seeding. Reseeded areas will be raked, harrowed, or dragged to cover the seed.

Fall seeding is recommended. Seeding should be done after September 1 and prior to ground frost.

Prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a joint inspection of the right-of-way. This inspection will be held to agree to an acceptable termination (and rehabilitation) plan. This plan shall include, but is not limited to, removal of facilities, drainage structures, or surface material, contouring, top soiling, or seeding. The authorized officer must approve the plan in writing prior to the holder's commencement of any termination activities.

The authorized officer may suspend or terminate in whole, or in part, any notice to proceed which has been issued when, in his judgment, unforeseen conditions arise which result in the approved terms and conditions being inadequate to protect the public health and safety or to protect the environment.